## SEQUENCE LISTING

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<110> Corona Villegas, Miguel
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       Gurrola Briones, Georgina
       Becerril Lujan, Baltazar
       Possani Postay, Lourival Domingos
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ctt d Leu I									taat	ggca	aac g	gteti	ettta	at		239
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aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg
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Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp
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Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys
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Lys 30	Ala	Lys	Asn	Gln	Gly 35	Gly	Ser	Tyr	Gly	Tyr 40	Cys	Tyr	Ser	Phe	Ala 45	
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Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala
ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg
                                                                     144
Pro Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp
tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa
                                                                     192
Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys
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aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc
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Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
                                                                      192
gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
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tgc
Cys
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      Centruroides exilicauda
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Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
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Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
Cys
65
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       CDS
       (1)..(207)
<222>
<223> Product= Sodium-channel modifier toxin precursor
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In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut

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<220 <220 <220 <220	1 > 2 >	(4)()														
	agg	29 gaa Glu														48
		tgg Trp														96
		caa Gln														144
		ggt Gly 50														192
		ggc Gly			taat	ggca	aaa g	gactt	tttt	at to	gtcca	atcaa	a caç	gaaat	att	247
gtaa	acgc	ttc 1	taa													261
<210 <211 <212 <213	L> 2> 3>	30 69 PRT Centi	ruroi	ides	exil	lica	ıda									
<400		30 Glu	Glv	ጥኒረን	I.e.i	Va l	Acn	Lave	Ser	Thr	Glv	Cve	Lve	ጥረድ	Clu	
-1	1	GIU	Giy	1 Y L	5	vai	TOIL	шуъ	361	10	GIY	Сув	пур	TÄT	15	
Cys	Phe	Trp	Leu	Gly 20	Lys	Asn	Glu	Phe	Cys 25	Asp	Lys	Glu	Cys	Lys 30	Ala	
Lys	Asn	Gln	Gly 35	Gly	Ser	Tyr	Gly	Tyr 40	Cys	Tyr	Ser	Phe	Ala 45	Cys	Trp	

Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys 55 Ser Cys Gly Arg Lys 65 <210> 31 <211> 195 <212> DNA <213> Centruroides exilicauda <220> <221> CDS <222> (1)..(195) <223> Product= Sodium-channel modifier toxin <400> 31 agg gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96 Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys 20 25 aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys 40 gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser tgc 195 Cys 65 <210> 32 65 <211> <212> PRT <213> Centruroides exilicauda <400> 32 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys 25 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys 40

Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser

60

55

50

<210>

<211> 69

34

Cys 65 <210> 33 <211> 261 <212> DNA <213> Centruroides exilicauda <220> <221> CDS <222> (1)..(207) <223> Product= Sodium-channel modifier toxin precursor In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut <220> 3'UTR <221> <222> (211)..(261) <223> <220> <221> sig\_peptide <222> (1)..(3)<223> <220> mat\_peptide <221> <222> (4)..() <223> Product = Sodium-channel modifier toxin <400> 33 gca agg gag ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag 48 Ala Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg 96 Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala 20 25 30 ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg 144 Pro Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp 35 40 tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa 192 Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys 50 55 tca tgc ggc aaa aaa taatggcaaa gactttttat tgtccatcaa cagaaatatt 247 Ser Cys Gly Lys Lys gtaacgcttc ttaa 261

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Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala
                                    25
Pro Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp
Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys
Ser Cys Gly Lys Lys
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<211> 195
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ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg
                                                                       96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
            20
                                25
                                                    30
aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc
                                                                      144
Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
        35
                            40
gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca
                                                                      192
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
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tgc
                                                                      195
Cys
65
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<213> Centruroides exilicauda
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Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
Cys
65
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      37
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       In the mature peptide, the last Cys is amidated, and the last Gly
        and the last 2 basic aminoacids are cut
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      Product = Sodium-channel modifier toxin
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                                                                       48
Ala Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser
-1 1
tgc tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag
                                                                       96
Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu
                20
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ata gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa

Ile	Gly	Ala	Gly 35	Tyr	Gly	Tyr	Cys	His 40	Gly	Phe	Gly	Cys	Trp 45	Cys	Glu		
		cca Pro 50															192
	aga Arg 65	aaa Lys	taa	gtaa	cgt (	cttt	tati	tg to	ctgc	gcaa	a aga	aatta	attg				241
taa	.cgct	tct '	taa														254
<21 <21 <21 <21	1> 2>	38 67 PRT Cent:	ruro:	ides	exi	lica	ıda										
<40	0>	38															
Ala -1	Lys 1	Glu	Gly	Tyr	Leu 5	Val	Asn	Ile	Tyr	Thr 10	Gly	Сув	Lys	Tyr	Ser 15		
Cys	Trp	Leu	Leu	Gly 20	Glu	Asn	Glu	Tyr	Cys 25	Ile	Ala	Glu	Cys	Lys 30	Glu		
Ile	Gly	Ala	Gly 35	Tyr	Gly	Tyr	Cys	His 40	Gly	Phe	Gly	Cys	Trp 45	Cys	Glu		
Gln	Phe	Pro 50	Glu	Asn	Lys	Pro	Ser 55	Tyr	Pro	Tyr	Pro	Glu 60	Lys	Ser	Cys		
Gly	Arg 65	Lys															
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aag	gaa	ggt Gly															48
tgg Trp	ttg Leu	ttg Leu	gga Gly 20	gaa Glu	aac Asn	gaa Glu	tat Tyr	tgc Cys 25	att Ile	gcg Ala	gaa Glu	tgc Cys	aaa Lys 30	gag Glu	ata Ile		96
gga	gct	ggt	tac	ggc	tat	tgc	cac	ggt	ttt	999	tgc	tgg	tgc	gaa	caa	:	144

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Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
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                                                                      189
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Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
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Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
            20
                                25
                                                    30
Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
<210> 41
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      254
<212> DNA
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       In the mature peptide, the last Cys is amidated, and the last Gly
        and the last 2 basic aminoacids are cut
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<221> 3'UTR
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      (205)..(254)
<223>
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aag gac ggt tat ccg gtg gag gtc acg ggc tgc aaa aag tct tgc tat
                                                                       48
Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
                                    10
aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac
                                                                       96
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa
                                                                      144
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
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		gcc Ala														192
	aaa Lys	aaa Lys	taa	tgg	caac	gct g	gttci	tatt	gg co	cacca	aacg	g aaa	atati	taa		244
cgc	tct	taa														254
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Lys 1	Asp	Gly	Tyr	Pro 5	Val	Glu	Val	Thr	Gly 10	Cys	Lys	Lys	Ser	Cys 15	Tyr	
Lys	Leu	Gly	Glu 20	Asn	Lys	Phe	Cys	Asn 25	Arg	Glu	Cys	Lys	Met 30	Lys	His	
Arg	Gly	Gly 35	Ser	Tyr	Gly	Tyr	Cys 40	Tyr	Phe	Phe	Gly	Cys 45	Tyr	Cys	Glu	
Gly	Leu 50	Ala	Glu	Ser	Thr	Pro 55	Thr	Trp	Pro	Leu	Pro 60	Asn	Lys	Ser	Cys	
Gly 65	Lys	Lys														
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<400	)> 4	13														
	gac	ggt Gly														48
		gga Gly														96
_		ggt Gly 35	_				_					_		_	_	144

192 gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys 55 <210> 44 <211> 64 <212> PRT Centruroides exilicauda <400> 44 Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu 40 Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys 55 <210> 45 <211> 258 <212> <213> Centruroides exilicauda <220> <221> CDS <222> (1)..(204) <223> Product= Sodium-channel modifier toxin precursor In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut <220> 3'UTR <221> (205)..(258) <222> <223> <400> 45 aag gac ggt tat ctg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48 Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96 Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His 20 cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144 Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192 Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys

ggc aaa aaa taa tggcaacgct gttctattgg ccaccaacgg aaatatttaa Gly Lys Lys 65	244
cgcttcttaa ttgc	258
<210> 46 <211> 67 <212> PRT <213> Centruroides exilicanda	
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Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His 20 25 30	
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu 35 40 45	
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys 50 60	
Gly Lys Lys 65	•
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aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His 20 25 30	96
cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu 35 40 45	144
gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys 50 55 60	192

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<213> Centruroides exilicauda
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Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
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                                                         15
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
                            40
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
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                        55
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<212> DNA
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       and the last 2 basic aminoacids are cut
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                                                                       48
Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata
                                                                       96
Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa
                                                                      144
Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
                            40
ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc ggc
                                                                      192
Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly
aga aaa taa tagcaacgtc tttttattgt ctgccaaaag aattattgta
                                                                      241
Arg Lys
65
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252 acgcttctta a <210> 50 <211> 66 <212> PRT <213> Centruroides exilicauda <400> 50 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly Arg Lys 65 <210> 51 <211> 189 <212> DNA <213> Centruroides exilicauda <220> <221> CDS <222> (1)..(189) <223> Product= Sodium-channel modifier toxin <400> 51 aag gag ggt tat ccg gtg aac ata tac acg ggc tgc aaa tac agt tgc 48 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys 96 tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln 144 40 ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc 189 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys <210> 52 <211> 63 <212> PRT

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Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
<210> 53
      322
<211>
<212> DNA
<213> Centruroides limpidus limpidus
<220>
<221> CDS
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      (5)..(265)
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       In the mature peptide, the last Asn is amidated, and the last Gl
       y and the last basic aminoacid are cut
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                                                                       49
    Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly
                     -15
aca gtg tgg gca aag gaa ggt tat ctg gta aac cac tcc acg ggg tgc
                                                                       97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys
            -1 1
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aaa tac gaa tgc tat aaa ttg gga gac aac gat tat tgc cta agg gaa
                                                                       145
Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
tgc aaa cag cag tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt
                                                                       193
Cys Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe
                        35
ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt
                                                                       241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
                    50
cct aag aaa aca tgc aac gga aaa taatggcaac gactttttat tgtccaccaa
                                                                       295
Pro Lys Lys Thr Cys Asn Gly Lys
                                                                       322
cagaaatatt gtaacgcttc ttaattg
<210> 54
<211> 87
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<213> Centruroides limpidus limpidus
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Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys
Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys
Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly
Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro
                50
                                     55
Lys Lys Thr Cys Asn Gly Lys
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<210> 55
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                                                                       96
tat aaa ttg gga gac aac gat tat tgc cta agg gaa tgc aaa cag cag
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
                                25
            20
tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt ggg tgc tgg tgc
                                                                      144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
                            40
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aag aaa aca
                                                                      192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr
                                                                      198
tgc aac
Cys Asn
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      66
<211>
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      PRT
<213> Centruroides limpidus limpidus
<400> 56
Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys Tyr Glu Cys
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr
   50
Cys Asn
<210> 57
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      322
<212>
      DNA
<213> Centruroides limpidus limpidus
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     CDS
<222>
      (5)..(265)
<223>
     Product= Sodium-channel modifier toxin precursor
       In the mature peptide, the last Tyr is amidated, and the last Gl
       y and the last basic aminoacid are cut
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                                                                       49
     Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Val Ile Gly
aca gtg tgg gca aag gaa ggt tat att gta aac tac tac gat ggc tgc
                                                                       97
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys
aaa tac gca tgt ctt aaa tta gga gag aac gat tat tgc tta agg gaa
                                                                      145
Lys Tyr Ala Cys Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu
                            20
tgc aaa gcg aga tac tac aaa tct gct ggc ggc tat tgc tac gct ttt
                                                                     193
Cys Lys Ala Arg Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe
gcg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt
                                                                      241
Ala Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
45
                    50
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Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys
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                                                                     145
Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
tgc aaa ttg aga tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt
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Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg

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		aaa Lys	_	_	_			taat	ggca	aac g	gtctt	ttta	at to	gtcca	accaa	295
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Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser

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49 97 145 aaa tac ggt tgc ttc tgg ttg gga aaa aac gaa aac tgc gat atg gaa Lys Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu 15 tgc aaa gcg aaa aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe 30 gcc tgc tgg tgc gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt 241 Ala Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu 50 295 cct aat aaa tcg tgc agc aaa aaa taatggcaac gtctttttat tgtccaccaa

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aac caa gga ggt agt tac ggc tat tgc tac tct ttt gcc tgc tgg tgc

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys

gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt cct aat aaa tcg

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					ggt Gly											193
					ccc Pro 50											241
		tgc Cys	_		aaa Lys	taat	agca	aac g	gtctt	ttta	at tg	gtcca	accaa	ı		289
caga	aata	att g	gtaac	gctt	c tt	aatt	g									316
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Tyr	Gly 15	Cys	Tyr	Glu	Leu	Gly 20	Asp	Asn	Gly	Tyr	Cys 25	Asp	Arg	Lys	Cys	
Lys 30	Ala	Glu	Ser	Gly	Asn 35	Tyr	Gly	Tyr	Cys	Tyr 40	Thr	Val	Gly	Cys	Trp 45	
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tat gaa ttg ggt gac aac ggt tac tgc gat agg aaa tgc aaa gcg gag
Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys Lys Ala Glu
age ggt aac tac ggc tat tgc tat act gtt ggg tgc tgg tgc gaa gga
                                                                      144
Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp Cys Glu Gly
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                                                                      192
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Lys Tyr Ile Cys Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu
tgt aaa gag ata gga gct ggt tac ggc tat tgc tac ggt ttt ggg tgc
                                                                      193
Cys Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys
tat tgc gaa gga ttt ccc gaa aat aaa ccg acc tgg ccc ctt cct aat
                                                                      241
Tyr Cys Glu Gly Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn
                                                                      289
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                                                                       97
Lys Tyr Glu Cys Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu
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tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc gac act ttt
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Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe
                        35
gag tgt tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tgg cct ctt
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Glu Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu
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cct aat aaa tca tgc ggc aaa aaa taatggcaac gtctttttat tgtccaccaa
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Pro Asn Lys Ser Cys Gly Lys Lys
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Tyr	Glu 15	Cys	Leu	Lys	Leu	Gly 20	Asp	Asn	Asp	Tyr	Cys 25	Leu	Arg	Glu	Cys	
Lys 30	Gln	Gln	Tyr	Gly	Lys 35	Gly	Ala	Gly	Gly	Tyr 40	Cys	Tyr	Ala	Phe	Gly 45	
Cys	Trp	Суз	Thr	His 50	Leu	Tyr	Glu	Gln	Ala 55	Val	Val	Trp	Pro	Leu 60	Lys	
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Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys Tyr Glu Cys
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ttg aaa ttg gga gac aac gat tat tgc ttg agg gaa tgc aaa cag cag
                                                                       96
Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
tac gga aaa ggt gct ggc ggc tat tgt tac gct ttt ggg tgc tgg tgc
                                                                      144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt aaa aat aag aca
                                                                      192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys Asn Lys Thr
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                                             60
tgc aac
                                                                      198
Cys Asn
65
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       88
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      Centruroides noxius
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Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
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Cys Asn
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                     -15
                                                                       97
aca gtg tgc gca aag gaa ggt tat ctg gtg aac aaa agc aca ggc tgt
Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
            -1 1
aaa tac aac tgc ttg ata ttg gga gaa aac aaa aac tgc gat atg gaa
                                                                      145
Lys Tyr Asn Cys Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu
tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gga ttt
                                                                      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe
ggg tgc tat tgt gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt
                                                                      241
Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
cct aat aaa aca tgc agc gga aaa taatggcaac gactttttat tgtccaccaa
                                                                      295
Pro Asn Lys Thr Cys Ser Gly Lys
cagaaatagt gtaacgcttc ttaattgc
                                                                      323
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<400> 90
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Val	Cys	Ala -1	Lys 1	Glu	Gly	Tyr	Leu 5	Val	Asn	Lys	Ser	Thr 10	Gly	Cys	Lys	
Tyr	Asn 15	Cys	Leu	Ile	Leu	Gly 20	Glu	Asn	Lys	Asn	Cys 25	Asp	Met	Glu	Cys	
Lys 30	Ala	Lys	Asn	Gln	Gly 35	Gly	Ser	Tyr	Gly	Tyr 40	Cys	Tyr	Gly	Phe	Gly 45	
Cys	Tyr	Cys	Glu	Gly 50	Leu	Ser	Asp	Ser	Thr 55	Pro	Thr	Trp	Pro	Leu 60	Pro	
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aca gtg tgg gca aag gaa ggt tat att gta aac tac cac gat ggc tgc
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Thr	Val -5	Trp	Ala	Lys	Glu -1	Gly 1	Tyr	Ile	Val	Asn 5	Tyr	His	Asp	Gly	Cys 10	
		gaa Glu														145
		ttg Leu														193
	_	tgg Trp 45	_			_		_				_				241
		aaa Lys	_	_				taat	ggca	aac g	gactt	ttta	at to	gtcca	accaa	295
caga	aaat	att g	gtaad	cgctt	c tt	aatt	gc									323
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Tyr	Glu	Cys	Tyr 15	Lys	Leu	Gly	Asp	Asn 20	Asp	Tyr	Cys	Leu	Arg 25	Glu	Cys	
Lys	Leu	Arg 30	Tyr	Gly	Lys	Gly	Ala 35	Gly	Gly	Tyr	Cys	Tyr 40	Ala	Phe	Gly	
Cys	Trp 45	Cys	Thr	His	Leu	Tyr 50	Glu	Gln	Ala	Val	Val 55	Trp	Pro	Leu	Pro	
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                                                                      96
ttg gga gat aac gat tat tgc cta agg gaa tgc aaa ttg aga tac gga
Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg Tyr Gly
            20
                                25
                                                                     144
aaa ggt gct ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc aca cat
Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Thr His
                                                                     192
ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aaa aaa aga tgc aat
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Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg Tyr Gly
Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Thr His
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Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg Cys Asn
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		aaa Lys		_	_			taat	ggca	aac g	gattt	ttta	at to	gteca	accaa	295
caga	aata	att g	jtaac	gctt	c tt	aatt	tc									323
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Val -5	Lys	Ala	Lys	Glu -1	Gly 1	Tyr	Leu	Val	Asn 5	Lys	Ser	Thr	Gly	Cys 10	Lys	
Tyr	Gly	Cys	Leu 15	Leu	Leu	Arg	Lys	Asn 20	Glu	Gly	Cys	Asp	Lys 25	Glu	Суѕ	
Lvs	Ala	Lvs	Asn	Gln	Gly	Gly	Ser	Tyr	Gly	Tyr	Cys	Tyr	Ser	Phe	Ala	

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser Cys Ser Lys Lys <210> 99 <211> 192 <212> DNA <213> Centruroides elegans <220> <221> CDS <222> (1)..(192) <223> Product= Sodium-channel modifier toxin <400> 99 ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc ctc ttg 48 Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys Leu Leu tta aga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag aac caa 96 Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys Asn Gln 25 gga ggt agt tac ggc tat tgc tac tct ttt gca tgc tgg tgc gaa ggt 144 Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys Glu Gly 40 ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca tgc agc 192 Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser Cys Ser <210> 100 <211> 64 <212> PRT <213> Centruroides elegans <400> 100 Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys Glu Gly 40

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                         -15
                                                                       97
aca gtg tgt gca aag gaa ggt tat ctg gta aac aag agc acg ggc tgc
Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
aaa tac agt tgc gtg tta ttg gga aaa aac gaa aac tgc gat aag gaa
                                                                      145
Lys Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu
tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gct ttt
                                                                      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
                            35
ggg tgc tgg tgt gaa gga ttg ccc gaa agt aca ccg act tat ccc att
                                                                      241
Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa
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Pro Gly Lys Ser Cys Gly Arg Lys
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Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys
Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly
Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro
Gly Lys Ser Cys Gly Arg Lys
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tta ttg gga aaa aac gaa aac tgc gat aag gaa tgc aaa gcg aag aac
                                                                       96
Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys Asn
caa gga ggt agt tac ggc tat tgc tac gct ttt ggg tgc tgg tgt gaa
                                                                      144
Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
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gga ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca tgc
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Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
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Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys Val
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Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
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    Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
     -20
aca gtt tgc gca aag gat ggt tat ctg gta aac aag agc acg ggc tgc
                                                                       97
Thr Val Cys Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-5
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aaa tac agt tgc ggg aaa ttg gga gaa aac gaa cac tgc gat aag gaa
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Lys Tyr Ser Cys Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu
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tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tat gct ttt
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
                             35
ggg tgc tgg tgt gaa gga ttg ccc gaa agt acc ccg act tat ccc att
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Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
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cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa
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Pro Gly Lys Ser Cys Gly Arg Lys
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Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly
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                                                                             96
aaa ttg gga gaa aac gaa cac tgc gat aag gaa tgc aaa gcg aag aac
Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys Lys Ala Lys Asn
                                   25
caa gga ggt agt tac ggc tat tgc tat gct ttt ggg tgc tgg tgt gaa
                                                                            144
Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
                               40
gga ttg ccc gaa agt acc ccg act tat ccc att cct ggt aaa tca tgc
                                                                           192
Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
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		tgg Trp -1														97
		tgc Cys														145
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	_	ggc Gly	_		taat	ggca	aac q	gtett	ttta	at to	gteca	accaa	a ca	gaaat	tatt	296
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Asn 15	Cys	Trp	Ile	Leu	Gly 20	Glu	Asn	Lys	Tyr	Cys 25	Asn	Ser	Glu	Cys	Lys 30	
Glu	Val	Gly	Ala	Gly	Tyr	Gly	Tyr	Cys	Tyr	Ala	Phe	Gly	Cys	Tyr	Cys	

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        and the last 2 basic aminoacids are cut
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     Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly
                         -15
aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc
                                                                       97
Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys
                -1 1
aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa
                                                                      145
Lys Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu
            15
tgc aca tgg aag cac cga gga ggt aat tac ggc tat tgc tac gga ttt
                                                                      193
Cys Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe
        30
ggg tgc tat tgc gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt
                                                                      241
Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
    45
                        50
tct aat aaa aga tgc ggc aaa aaa taatggcaac gactttttat tgtccaccaa
                                                                      295
Ser Asn Lys Arg Cys Gly Lys Lys
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cagaaatatt gtaacgcttc ttaattgc
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Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys
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Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys
Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly
Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser
45
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                                                             60
Asn Lys Arg Cys Gly Lys Lys
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                                    10
                                                         15
ata ttg gga gaa aac aaa tac tgc aat agg gaa tgc aca tgg aag cac
                                                                       96
Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
            20
cga gga ggt aat tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa
                                                                      144
Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
        35
gga ttg tcc gat agt aca ccg act tgg ccc ctt tct aat aaa aga tgc
                                                                      192
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
                        55
<210> 116
<211>
      64
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<212>

PRT

<213> Centruroides elegans

<400> 116

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Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
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     -20
                         -15
aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc
                                                                       97
Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys
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aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa

145

Lys	Tyr	Thr	Cys 15	Trp	Ile	Leu	Gly	Glu 20	Asn	Lys	Tyr	Cys	Asn 25	Arg	Glu	
		tgg Trp 30														193
		tat Tyr														241
		aaa Lys	_	_				taat	ggca	aac g	gactt	ttta	at to	gteca	accaa	295
caga	aaat	agt 9	gtaad	egeti	c tt	aatt	gc									323
<210 <211 <212 <213	l > 2 >	118 87 PRT Centi	ruro:	ides	eleç	jans										
<400	)>	118														
Met -20	Asn	Ser	Leu	Leu	Met -15	Ile	Thr	Ala	Сув	Leu -10	Val	Met	Phe	Gly	Thr -5	
Val	Trp	Ala	Lys -1	Lys 1	Asp	Gly	Tyr	Leu 5	Val	Asp	Lys	Thr	Gly 10	Сув	Lys	
Tyr	Thr	Cys 15	Trp	Ile	Leu	Gly	Glu 20	Asn	Lys	Tyr	Cys	Asn 25	Arg	Glu	Cys	
Thr	Trp 30	Lys	His	Arg	Gly	Gly 35	Asn	Tyr	Gly	Tyr	Cys 40	Tyr	Gly	Phe	Gly	
Cys 45	Tyr	Cys	Glu	Gly	Leu 50	Ser	Asp	Ser	Thr	Pro 55	Thr	Trp	Pro	Leu	Pro 60	
Asn	Lys	Arg	Cys	Gly 65	Lys	Lys										
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<220 <221 <222 <223	L> ( 2>	CDS (1). Produ	-		ium-c	chanr	nel m	nodif	fier	toxi	in					
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Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp
                                                                       96
ata ttq qqa qaa aac aaa tac tgc aat agg gaa tgc aca tgg aag cac
Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
cga gga ggt aat tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa
                                                                      144
Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
gga ttg tcc gat agt aca ccg act tgg ccc ctt cct aat aaa aga tgc
                                                                      192
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Arg Cys
<210> 120
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<212>
      PRT
<213>
      Centruroides elegans
<400> 120
Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp
Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
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Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
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Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Arg Cys
<210>
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       DNA
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        and the last 2 basic aminoacids are cut
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       (1)..(4)
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      3 'UTR
<221>
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<222>
<223>
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acc Thr	gtg Val	tgg Trp -5	gca Ala	aag Lys	gac Asp	ggt Gly -1	tat Tyr 1	ctg Leu	gtg Val	aag Lys	aag Lys 5	agc Ser	gac Asp	ggc Gly	tgc Cys	97
		ggt Gly														145
tgc Cys	aaa Lys	gcg Ala	ccg Pro	aac Asn 30	caa Gln	gga Gly	ggt Gly	agt Ser	tac Tyr 35	ggc Gly	tat Tyr	tgc Cys	tac Tyr	ctt Leu 40	ctt Leu	193
gly ggg	tgc Cys	tgg Trp	tgc Cys 45	gaa Glu	ggt Gly	atg Met	cct Pro	gaa Glu 50	agt Ser	aca Thr	ccg Pro	act Thr	tat Tyr 55	ccc Pro	ctt Leu	241
		aaa Lys 60						taat	ggca	aac <u>c</u>	gtctt	ttta	at t <u>e</u>	gteca	actaa	295
caga	aat	att g	gtaad	cgctt	c tt	aatt	gc				•					323
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Met	Asn	Ser -20	Leu	Leu	Met	Ile	Thr -15	Ala	Cys	Leu	Val	Leu -10	Ile	Gly	Thr	
Val	Trp -5	Ala	Lys	Asp	Gly -1	Tyr 1	Leu	Val	Lys	Lys 5	Ser	Asp	Gly	Cys	Lys 10	
Tyr	Gly	Cys	Met	Leu 15	Lys	Ile	Gly	Asp	Ala 20	Gly	Cys	Asp	Lys	Glu 25	Cys	
Lys	Ala	Pro	Asn 30	Gln	Gly	Gly	Ser	Tyr 35	Gly	Tyr	Cys	Tyr	Leu 40	Leu	Gly	

Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro 45 55 Gly Lys Ser Cys Gly Lys Lys 60 <210> 123 186 <211> <212> DNA <213> Centruroides gracilis <220> <221> CDS (1)..(186) <222> Product = Sodium-channel modifier toxin <400> 123 tat ctg gtg aag aag agc gac ggc tgc aaa tac ggt tgc atg ctc aag 48 Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys ata gga gac gct ggc tgt gat aag gaa tgc aaa gcg ccg aac caa gga 96 Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly 20 ggt agt tac ggc tat tgc tac ctt ctt ggg tgc tgg tgc gaa ggt atg 144 Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met 35 40 cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca tgc 186 Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys 55 <210> 124 62 <211> <212> PRT Centruroides gracilis <213> <400> 124 Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys 10 Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly 20 Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys 55

<210> 125 <211> 323

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       In the mature peptide, the last Cys is amidated, and the last Gly
        and the last 2 basic aminoacids are cut
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                                                                        49
     Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
acc gtg tgg gca aag gac ggt tat ctg gtg aag gag agc gac ggc tgc
                                                                        97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys
-5 -1 1 5
                                                                       145
aaa tac ggt tgc atg ctc aag ata gga gac gct ggc tgt gat aag gaa
Lys Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu
10
                                                                       193
tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc tac ctt ctt
Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu
ggg tgc tgg tgc gaa ggt atg cct gaa agt aca ccg act tat ccc ctt
                                                                       241
Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu
                                                      55
                                 50
cct ggt aaa tca tgc ggc aaa aaa taatggcaac gtctttttat tgtccactaa
                                                                       295
Pro Gly Lys Ser Cys Gly Lys Lys
                                                                       323
cagaaatatt gtaacgcttc ttaattgc
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<210> 126 <211> 87

<212> PRT

<212>

PRT

<213> Centruroides gracilis

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Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys
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Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys
Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly
            30
                                35
Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
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Gly Lys Ser Cys Gly Lys Lys
    60
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      Product= Sodium-channel modifier toxin
<400> 127
tat ctg gtg aag gag agc ggc tgc aaa tac ggt tgc atg ctc aag
                                                                      48
Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
                5
ata gga gac gct ggc tgt gat aag gaa tgc aaa gcg ccg aac caa gga
                                                                      96
Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
            20
ggt agt tac ggc tat tgc tac ctt ctt ggg tgc tgg tgc gaa ggt atg
                                                                     144
Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
        35
cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca tgc
                                                                     186
Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
<210> 128
<211>
      62
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<400> 128

15

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Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
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Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
                        55
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<223>
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gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga
                                                                       49
     Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
                                         -10
                     -15
acg gtg tgg gca aag gac ggt tat ctg gtg aac aag agc acg ggc tgc
                                                                       97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
            -1 1
                                                                      145
aaa tac agt tgc ata gaa aat ata aac gac agt cac tgc aat gag gaa
Lys Tyr Ser Cys Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu
```

20

tgt a Cys I 3																193
tac t Tyr C 45																241
cct g Pro G								taat	ggca	aac g	gtett	ttta	at to	gteca	accaa	295
cagaaatatt gtaacgcttc ttaattgc 3													323			
<210><211><212><213>	> 8	.30 7 PRT Centr	ruroi	ides	grad	cilis	5									
<400>	- 1	.30														
Met A	Asn	Ser	Leu	Leu -15	Met	Ile	Thr	Ala	Cys -10	Leu	Val	Leu	Ile	Gly -5	Thr	
Val T	rp	Ala -1	Lys 1	Asp	Gly	Tyr	Leu 5	Val	Asn	Lys	Ser	Thr 10	Gly	Cys	Lys	
Tyr S	Ser 15	Cys	Ile	Glu	Asn	Ile 20	Asn	Asp	Ser	His	Cys 25	Asn	Glu	Glu	Cys	
Ile S 30	Ser	Ser	Ile	Arg	Lys 35	Gly	Ser	Tyr	Gly	Tyr 40	Cys	Tyr	Lys	Phe	Tyr 45	
Cys T	yr	Cys	Ile	Gly 50	Met	Pro	Asp	Ser	Thr 55	Gln	Val	Tyr	Pro	Ile 60	Pro	
Gly L	ys	Thr	Cys 65	Ser	Thr	Glu										
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<400>		31														
aag g Lys A 1				_			_	_	_		_			_	_	48

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96
ata gaa aat ata aac gac agt cac tgc aat gag gaa tgt ata tcg tcg
Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys Ile Ser Ser
                                25
                                                                       144
atc cgc aaa ggt agt tac ggc tat tgc tac aaa ttt tac tgt tat tgc
Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys
                            40
ata ggt atg ccc gat agt aca cag gtt tat cct att cct ggt aaa act
                                                                       192
Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro Gly Lys Thr
    50
                        55
                                                                       204
tgc agc aca gaa
Cys Ser Thr Glu
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<213> Centruroides gracilis
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Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys
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Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys
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Cys Ser Thr Glu
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<222> (1)..(4)
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                                                                       97
acc gtg tgg aca aag gac ggt tat ctg gtg aag aag agc gac ggc tgc
Thr Val Trp Thr Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
-5 -1 1 5
aaa tac ggt tgc gta atg ttg gtc gga gac agt ggc tgc gat acg gaa
                                                                      145
Lys Tyr Gly Cys Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu
                    15
                                        20
                                                                      193
tgc aaa gcg aag aat caa ggt ggt aaa aaa gga tgg tgc tac gcc ttt
Cys Lys Ala Lys Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe
ggg tgc tgg tgc aca ggt atg ccc gac agt aca cag gtt tat ccc ctt
                                                                      241
Gly Cys Trp Cys Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu
cct gat aaa tca tgc ggc aaa aaa taatggcaac gtctttttat tgtccaccaa
                                                                      295
Pro Asp Lys Ser Cys Gly Lys Lys
cagaaatagt gtaacgcttc ttaattgc
                                                                      323
<210> 134
<211> 87
<212> PRT
<213> Centruroides gracilis
<400> 134
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
        -20
                            -15
Val Trp Thr Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys
Tyr Gly Cys Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu Cys
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Lys Ala Lys Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro 50 Asp Lys Ser Cys Gly Lys Lys <210> 135 186 <211> <212> DNA <213> Centruroides gracilis <220> CDS <221> (1)..(186) <222> Product = Sodium-channel modifier toxin <400> 135 tat ctg gtg aag aag agc gac ggc tgc aaa tac ggt tgc gta atg ttg 48 Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Val Met Leu 96 gtc gga gac agt ggc tgc gat acg gaa tgc aaa gcg aag aat caa ggt Val Gly Asp Ser Gly Cys Asp Thr Glu Cys Lys Ala Lys Asn Gln Gly 20 25 ggt aaa aaa gga tgg tgc tac gcc ttt ggg tgc tgg tgc aca ggt atg 144 Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys Thr Gly Met ccc gac agt aca cag gtt tat ccc ctt cct gat aaa tca tgc 186 Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro Asp Lys Ser Cys <210> 136 <211> 62 <212> PRT <213> Centruroides gracilis <400> 136 Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu Cys Lys Ala Lys Asn Gln Gly 20 Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys Thr Gly Met 35

Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro Asp Lys Ser Cys

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55

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<211>
<212> DNA
<213> Centruroides sculpturatus
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       CDS
<222>
       (5)..(265)
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<223>
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        and the last 2 basic aminoacids are cut
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       3'UTR
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<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na+-channels
<303>
       Toxicon
<304>
       39
<305>
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<306>
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<307> 2001-12-01
<309>
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gaag atg aat tcg ttg ttg atc atc act gtt tgt ttg ttc ctg atc gga
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     Met Asn Ser Leu Leu Ile Ile Thr Val Cys Leu Phe Leu Ile Gly
                     -15
                                          -10
acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc
                                                                       97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
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Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu
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Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
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Lys Thr Cys Tyr Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys
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tgc tat tgc gaa gga ttg ccc gat agt aca cag act tgg ccc ctt cct
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Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys Tyr Cys Glu
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Lys 30	Ala	Glu	Asn	Gln	Gly 35	Gly	Ser	Tyr	Gly	Tyr 40	Cys	туr	Ala	Phe	Ala 45		
Cys	Trp	Cys	Glu	Gly 50	Leu	Pro	Glu	Ser	Thr 55	Pro	Thr	Tyr	Pro	Leu 60	Pro		
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Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
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Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
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Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
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Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
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Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
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Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
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Pro Asn Lys Ser Cys Gly Lys Lys
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Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
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ata gac aag aca gga gac aaa aat tgc gat agg aat tgc aag aat gaa
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Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu
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gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga
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Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
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ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt aaa
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Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys
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Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu
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Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
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                                         -10
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Thr Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys
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aca ctc gaa tgc ata gac atg aca gga gac aaa aat tgc gat agg aat
                                                                      145
Thr Leu Glu Cys Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn
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                            20
tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc
                                                                      193
Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys
tgg tgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt
                                                                      241
Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly
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45
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296
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ata gac atg aca gga gac aaa aat tgc gat agg aat tgc aag aag gaa
Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu
gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga
                                                                      144
Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
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                            40
ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt aaa
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Ile
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Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
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Val Trp Ser Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg
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tac aag tgc act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc
                                                                      145
Tyr Lys Cys Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys
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                                            25
aag agc caa gga ggt gat tot ggc att tgc caa tot aag gcg tgt tat
                                                                      193
Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr
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                    35
                                                             45
                                                                      241
tgc caa ggt ttg ccc gaa gat aca aag act tgg ccc ctt att ggt aaa
Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
                                                                      296
tta tgc ggc aga aaa taatggcttc gtctttttat tgttcaccaa caaaaatagt
Leu Cys Gly Arg Lys ·
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Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr
Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
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Leu Cys Gly Arg Lys
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act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc aag agc caa
Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys Lys Ser Gln
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144

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Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr Cys Gln Gly
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Thr, Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys
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aaa tac gaa tgc ttt aaa ttg gga gac aac gat tat tgc ctg agg gaa
                                                                       145
Lys Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
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                            20
tgc aaa ttg aga cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt
                                                                       193
Cys Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe
ggg tgc tgg tgc aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt
                                                                       241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
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cct aag aaa aaa tgc aac gga aaa taatggcaac gactttttat tgtccaccaa
Pro Lys Lys Cys Asn Gly Lys
cagaaatagt gtaacgcttc ttaatt
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Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys
        -1 1
Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys
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Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly

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                                                                      96
Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg
cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc
                                                                     144
His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt cct aag aaa aaa
                                                                     192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys
tgc aac
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Cys Asn
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Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg
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		tgc Cys														241
		aca Thr					taat	ggca	ac g	gactt	ttta	it t <u>s</u>	jtcta	accaa	ı	292
caga	aat	agt g	gtaac	gctt	c tt	aatt	gc									320
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Asn	Cys 15	Trp	Lys	Leu	Gly	Asp 20	Asn	Asp	Tyr	Cys	Asn 25	Arg	Glu	Cys	Lys	
Trp 30	Lys	His	Ile	Gly	Gly 35	Ser	Tyr	Gly	Tyr	Cys 40	Tyr	Gly	Phe	Gly	Cys 45	
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                                    10
aaa ttg gga gat aac gat tat tgc aat agg gaa tgt aaa tgg aag cac
                                                                      96
Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys Trp Lys His
            20
                                25
ata gga ggt agt tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa
                                                                     144
Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
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tac caa gag tgt cag gat tgt tgt aag aaa gct gga cac agt gga gga
                                                                       96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
            20
                                25
acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaaaat cagttaataa
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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
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                                                                       96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
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                                                                      126
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
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                                                                      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
                                25
            20
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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga
                                                                      96
Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
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Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
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Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
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tac tat caa tgt gat gaa tgt tgc a Tyr Tyr Gln Cys Asp Glu Cys Cys L 20 2	s Lys Ala Gly Asp Arg A	
acc tgc gag tat ttc aag tgt aaa t Thr Cys Glu Tyr Phe Lys Cys Lys C 35 40		t 142
gaattaagaa tatcaaagct ggaagctgtt	aagaagtga aaaataaaga tt	ag 196
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Tyr Tyr Gln Cys Asp Glu Cys Cys L 20 2		la Gly
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tac tat caa tgt gat gaa tgt tgc a Tyr Tyr Gln Cys Asp Glu Cys Cys L 20	g aaa gct gga gac cgt g s Lys Ala Gly Asp Arg A 30	ca gga 96 la Gly
acc tgc gag tat ttc aag tgt aaa t Thr Cys Glu Tyr Phe Lys Cys Lys C 35 40		129
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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala

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                                                                      96
tac caa gag tgt cag gat tgt tgc aag aaa gct gga cac aat gga gga
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
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acc tgc atg ttt ttc aag tgt aaa tgt gcg
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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
<210> 216
<211> 42
<212> PRT
<213> Centruroides limpidus limpidus
<400> 216
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
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<222>
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					gag Glu											96
	_				aag Lys	_		_			taa	acto	cgaat	tgt		142
gaat	taag	gaa t	tatca	aaago	et gg	gaago	ctatt	t taa	agaag	gtga	aaaa	ataaa	aga t	ttatt	taaatt	202
tccg	gc															207
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Tyr	Gly	Gln	Cys 20	Asp	Glu	Cys	Cys	Lys 25	Lys	Ala	Gly	Asp	Arg 30	Ala	Gly	
Asn	Cys	Val 35	Tyr	Phe	Lys	Cys	Lys 40	Сув	Asn	Pro				•		
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					gag Glu				aaa					gca		96
	_				aag Lys	_		_								129
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Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
                                    10
tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                       96
Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
            20
                                25
aac tgc gtg tat ttc aag tgt aaa tgt aac caa taa actcgaatgt
                                                                      142
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
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                            40
gaacttaaga atatcaaagc tggaagctta tttaagaagt gaaaaataaa gattattaaa
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taagaga
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      43
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Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly

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       Product= Erg-channel modifier toxin
<400> 223
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                                                                       48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
                                    10
                                                         15
tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                       96
Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
            20
aac tgc gtg tat ttc aag tgt aaa tgt aac caa
                                                                      129
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
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      224
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      43
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       PRT
      Centruroides limpidus limpidus
<213>
<400> 224
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                                    10
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Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
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                                                                        96
tat ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
aac tgc gtg tat tta aag tgt aaa tgt aac caa taa actcgaatg
                                                                       141
Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln
<210> 226
<211> 43
<212> PRT
<213> Centruroides limpidus limpidus
<400> 226
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Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln
<210> 227
<211> 129
<212> DNA
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<223> Product= Erg-channel modifier toxin
<400> 227
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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
tat ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                        96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
aac tgc gtg tat tta aag tgt aaa tgt aac caa
                                                                       129
Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln
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<211> 43
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<213> Centruroides limpidus limpidus
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Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln
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<212> DNA
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tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                   96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
                              25
acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt
                                                                  142
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataagat tattaaattt
                                                                  202
244
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<211> 43
<213> Centruroides noxius
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Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                        96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
                                 25
acc tgc gtg tat tac aag tgt aaa tgt aac cca
                                                                       129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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<212> PRT
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Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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                                                                       96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt
                                                                      142
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttattaaatt
                                                                      202
tccgcaaatt
                                                                      212
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      43
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      PRT
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<400> 234
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Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr
tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gaa cgt gta gga
                                                                       96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
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                                25
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-	gc gtg ys Val 35			_	_		_								129
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Tyr G	ly Gln	Cys 20	Asp	Glu	Cys	Суѕ	Lys 25	Lys	Ala	Gly	Glu	Arg 30	Val	Gly	
Thr Cy	ys Val 35	Tyr	Tyr	Lys	Cys	Lys 40	Cys	Asn	Pro						
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Asp Ar	237 ga gat cg Asp	_	Cys	_	-			Lys	_				ĞÌу		48
	aa gag ln Glu														96
_	gc gtg /s Val 35			_	_		_			taa	acto	gaat	gt		142
gaatta	aagaa t	atca	aago	t gg	gaago	tgtt	taa	gaag	ıtga	aaaa	taaa	ıga t	tatt	aaatt	202
tccgca	aatt														212
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Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

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Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro 35 40

<210> 241 <211> 194 <212> DNA <213> Centruroides elegans

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  <222>
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                                                                        96
  tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga
  Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
             20
  acc tgc atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat aaattaataa
                                                                       149
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
         35
                              40
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 Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
             20
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
         35
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 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
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tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly 20 25 30	96
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Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly 20 25 30	
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala 35 40	
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tac caa cag tgt gaa att tgt tgc aag aaa gct gga cac aga gga gga Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly 20 25 30	96
acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta taa actcgaatgt Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val 35 40	142
gaattaagaa tatcaaagct gggaactgtt tacgatgtga aaaataaaga ttatt	197
<210> 246 <211> 43	

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<213> Centruroides elegans
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Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
<210> 247
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<223> Product= Erg-channel modifier toxin
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
                                    10
tac caa cag tgt gaa att tgt tgc aag aaa gct gga cac aga gga gga
                                                                       96
Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta
                                                                      129
Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
<210> 248
<211> 43
<212> PRT
<213> Centruroides elegans
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
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<400> 249
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                                                                      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
tat cat caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga
                                                                      96
Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
                                25
            20
                                                    3.0
aac tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt
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Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
        35
gaattaagaa tatgaaagat ggaagctgtt taagaagtga aaaataaaga ttat
                                                                     196
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Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
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            20
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Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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      (1)..(129)
<223> Product= Erg-channel modifier toxin
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<400> 251

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tat cat caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly 20 25 30	96										
aac tgc gtg tat tac aag tgt aaa tgt aac cca Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro 35 40	129										
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Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly 20 25 30											
Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro 35 40											
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tac caa gag tgt acg gat tgt tgc aag aaa tac gga cac aat gga gga Tyr Gln Glu Cys Thr'Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly 20 25 30	96										
acc tgc atg ttc ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa Thr Cys Met Phe Phe Lys Cys Lys Cys Ala 35 40	149										
tataaaagct gtaagctatt tacgaagtga aaaataaaga ttat											

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<212> PRT
<213> Centruroides gracilis
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Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
<210> 255
      126
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His
tac caa gag tgt acg gat tgt tgc aag aaa tac gga cac aat gga gga
                                                                      96
Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
acc tgc atg ttc ttc aag tgt aaa tgt gcg
                                                                     126
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
        35
                            40
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       PRT
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Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
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      (130)..(193)
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                                                                      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
                                                        15
                                                                      96
tac get cag tgt acg gee tgt tge aag aag get gga cac aat aaa gga
Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
            20
acc tgc gac ttt ttc aag tgt aaa tgt acg taa tctcgaagaa gaattaatta
                                                                     149
Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
        35
                                                                     193
tatcaaagct tggaaccaat taccgaagtg gaaaaattaa gaat
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<213> Centruroides gracilis
<400> 258
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
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            20
                                25
Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
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        35
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<223> Product= Erg-channel modifier toxin
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                                                                       48
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                                                                       96
tac gct cag tgt acg gcc tgt tgc aag aag gct gga cac aat aaa gga
Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
                                                                      126
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Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
        35
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Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
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      (1)..(141)
      Product = Erg-channel modifier toxin precursor
       In the mature peptide, the last Ser is amidated, and the last Gly
        and the last basic aminoacid are cut
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<222>
     (142)..(197)
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                                                                       48
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                                    10
tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga
                                                                       96
Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly
                                                                      141
acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt gga aga
Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg
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35 40 45 tgaatttata atatcaaagc tgtaagctat ttacgaagtg aaaaataaag attatt 197 262 <210> <211> 47 <212> PRT Centruroides gracilis <400> 262 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg 40 <210> 263 <211> 135 <212> DNA <213> Centruroides gracilis <220> <221> CDS (1)..(135) <222> Product= Erg channel modifier toxin <400> 263 48 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga ccc Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga 96 Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly 20 135 acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser 40 <210> 264 <211> 45 <212> PRT <213> Centruroides gracilis <400> 264 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly 20 25

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                                                                        96
tac caa gag tgt cag gat tgt tgc aag aaa gct gga cat aat gga gga
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
            20
acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa
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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
        35
tatcaaagct gtaagctatt tatgaagtga aaaataaaga ttatt
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       266
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       42
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       PRT
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       266
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                                                          15
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
                             40
        35
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       126
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       Centruroides sculpturatus
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<223> Product= Erg-channel modifier toxin
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                                    10
                                                                      96
tac caa gag tgt cag gat tgt tgc aag aaa gct gga cat aat gga gga
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
                                                                      126
acc tgt atg ttt ttc aag tgt aaa tgt gcg
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
<210> 268
<211> 42
<212> PRT
<213> Centruroides sculpturatus
<400> 268
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
                                25
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aga gga gga
                                                                      96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly
            20
                                25
                                                    30
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acc tgc gat ttt ttc aag tgt aaa tgt aaa gta taa actcgaatgt Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val 35 40	142									
gaattaagaa tatcaaagct gggaactgtt tacgaagtga aaaataaaga ttttg										
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tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aga gga gga Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly 20 25 30	96									
acc tgc gat ttt ttc aag tgt aaa tgt aaa gta Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val 35 40	129									
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Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val <210> 273 <211> 197 <212> DNA <213> Centruroides sculpturatus <220> <221> CDS <222> (1)..(132) <223> Product= Erg-channel modifier toxin precursor <220> <221> 3'UTR <222> (133)..(197) <223> <400> 273 gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr tac ggt caa tgt gat gac tgt tgc aag aaa gct gga gac cgt gca gga 96 Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttatt 197 <210> 274 <211> 43 <212> PRT <213> Centruroides sculpturatus <400> 274 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro 40 <210> 275 <211> 129

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                                                                      48
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tac ggt caa tgt gat gac tgt tgc aag aaa gct gga gac cgt gca gga
                                                                      96
Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
acc tgc gtg tat tac aag tgt aaa tgt aac cca
                                                                     129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
        35
                            40
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      43
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      PRT
<213> Centruroides sculpturatus
<400> 276
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Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
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<212> DNA
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
                5
                                    10
                                                        15
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tac ggt Tyr Gly														96
acc tgc Thr Cys			_	_		_			taa	acto	cgaat	tgt		142
gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga tta												195		
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Asp Arg	Asp Ser	Cys 5	Val 2	Asp	Lys	Ser	Arg 10	Cys	Gly	Lys	Tyr	Gly 15	Tyr	
Tyr Gly	Gln Cys 20	Asp	Glu (	Cys	Cys	Lys 25	Lys	Ala	Gly	Asp	Arg 30	Ala	Gly	
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tac ggt Tyr Gly														96
acc tgc of Thr Cys			_	_		_								129
<211> 4 <212> P	80 3 RT entruro:	ides	sculp	ptur	atus	3								
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                                                                        96
tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aat gga gga
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
            20
acc tgt atg ttt ttc aag tgt atg tgc gta aac tcg aag atg aat
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                                                  45
        35
                             40
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Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
            20
                                 25
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
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<220>
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<223> oligonucleotite T22NN
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gmaarggarg gttatc
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       (7)..(7)
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      (17)..(17)
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<211> 27
<212> DNA
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<220>
<223> PCR Direct oligonucleotide primer
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       Oligonucleotide
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       (1)..(\overline{2}4)
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                                                                          24
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      24
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